



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/520,662

09/26/2005

Takashi Yasoshima

Q85681

9405

7590

11/26/2008

Sughrue Mion
2100 Pennsylvania Avenue NW
Washington, DC 20037-3213

EXAMINER

SOLOMON, LISA

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

11/26/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/520,662	Applicant(s) YASOSHIMA ET AL.	
	Examiner LISA M. SOLOMON	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1-26 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-35 is/are allowed.
- 6) ☒ Claim(s) 36 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/10/05, 9/26/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 27-35 including new claims 36-37 (Group IV) in the reply filed on 2/25/2008 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. (7,381,341).

In re claim 36, *Shimada et al.* (341') teaches a method of manufacturing a liquid jet head including a passage-forming substrate (10, Figs. 1 and 2B) in which pressure generating chambers (12, Fig. 2B) communicating with nozzle orifices (21, Fig. 2B) for jetting liquid are formed [Column 6 lines 3-18, Column 7 lines 12-18]; piezoelectric elements (300, Fig. 2B) which are provided on one side of the passage-forming substrate (10) and cause pressure changes in the pressure generating chambers (12) [Column 7 lines 26-32; 41-49]; and a plate (30, Fig. 2B) which is made of a single crystal silicon substrate and has a reservoir portion (32, Fig. 2B) constituting at least part of a reservoir (100, Fig. 2B) communicating with the pressure generating chambers (12) [Column 7 line 59-Column 8 line 13], the method comprising: forming a protective film (not shown) having resistance to liquid and made of silicon dioxide on an entire

Art Unit: 2861

surface of the plate (30) including an inner wall surface of the reservoir portion (32) by thermally oxidizing the plate (30) [Column 11 lines 30-32]; and joining the passage-forming substrate (10), in which the piezoelectric elements (300) have been formed, and the plate (30), on which the protective film (not shown) has been formed [Column 9 lines 51-55].

Although, Shimada et al. (341') does not explicitly teach that the protective film is made of silicon dioxide, it is well known in the art that under exposure to oxygen, a silicon surface oxidizes to form silicon dioxide (i.e. thermal oxidation) as taught in the attached Non-Patent Literature titled Silicon Dioxide and the Wikipedia Article-Silicon dioxide. Furthermore, it is well known in the art that silicon dioxide is very beneficial in microelectronics as it is a high-quality electrical insulator and in electrical applications can be used to protective film or layer as taught in Wikipedia Article-Silicon dioxide. In addition, the most common method of depositing or growing silicon dioxide on Silicon is thermal oxidation also taught in both attached articles on Silicon Dioxide. Therefore, it would be obvious to one of ordinary skill in the art at the time that the invention was made to provide a protective film of silicon dioxide on the entire surface of the plate including an inner wall surface of the reservoir portion by thermally oxidizing the plate for the purposes of providing protection for the plate from the harmful effects of the liquid ejected from the liquid jet head as is known in the art.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. (7,381,341) as applied to claim 36 above, and further in view of Hashizume, Tsutomu (JP 10264383).

In re claim 37, *Shimada et al. (341')* teaches the method according to claim 36 [see rejection above], further comprising the step of: forming a protective film (110, Fig. 7B) which has resistance to liquid, at least on inner wall surfaces of the pressure generating chambers (12) [Column 12 lines 21-29]. However, *Shimada et al. (341')* does not teach that the protective film is made of a conductive material.

Hashizume, Tsutomu (JP 10264383) teaches forming a protective film which is made of a conductive material and has resistance to liquid, at least on inner wall surfaces of pressure generating chambers [Abstract lines 4-8].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide forming a protective film which is made of a conductive material and has resistance to liquid, at least on inner wall surfaces of pressure generating chambers as taught by Hashizume, Tsutomu (JP 10264383) for the purposes of using different types of ink in the liquid jet head [Abstract lines 1-3].

Allowable Subject Matter

4. Claims 27-35 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claims 27-35 is the inclusion of the method steps of "forming a mask pattern on a surface of a sealing plate forming material, which becomes the sealing plate; forming the reservoir portion and the piezoelectric element

Art Unit: 2861

holding portion by etching the sealing plate forming material except a region where the mask pattern has been formed; removing the mask pattern to form the sealing plate; forming a protective film having resistance to liquid at least on an inner wall surface of the reservoir portion in the sealing plate; and joining the passage-forming substrate, in which the piezoelectric elements have been formed, and the sealing plate” (claim 27). It is these steps found in the claims, as they are claimed in the combination, that has not been found, taught, or suggested by the prior art of record, which makes these claims allowable over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LISA M. SOLOMON whose telephone number is (571)272-1701. The examiner can normally be reached on Monday - Friday from 8:00 am - 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUU MATTHEW/
Supervisory Patent Examiner, Art Unit 2861

Lisa M Solomon
Examiner
Art Unit 2861

/L. M. S./
Examiner, Art Unit 2861